

On the breeding biology of the Blackthroated [*Ploceus benghalensis* (Linnaeus)] and the Streaked (*Ploceus* *manyar flaviceps* Lesson) Weaver Birds in the Kumaon Terai

BY

V. C. AMBEDKAR

(With two plates)

INTRODUCTION

This paper is based on observations of the nesting habits of the Black-throated Weaver (*Ploceus benghalensis*) and the Streaked Weaver (*Ploceus m. flaviceps*) made during the breeding seasons of 1961, 1962, 1963 and 1968 and is a continuation of the studies on bayas started by Sálim Ali in 1931 and resumed in 1953 (Ali & Ambedkar 1956, 1957 ; Ambedkar 1958, 1964, 1968 ; Ali & Crook 1959 ; Crook 1960, 1963). The initial field work started in Bombay neighbourhood (1931), was resumed in the Poona area in 1953 and extended to Rudrapur, Kumaon terai, Nainital dist., Uttar Pradesh, after the re-discovery there of Finn's Baya (*Ploceus megarhynchus*) in 1959.

METHODS

To obtain comparative data and for evaluating observations on all four species of Indian weaver birds, similar methods were employed in their study with minor refinements dictated by experience. Methods and area of study have been described in earlier papers (Ambedkar 1964, 1968).

Blackthroated Weaver

Ploceus benghalensis

(Plate I)

GEOGRAPHICAL DISTRIBUTION

Ploceus benghalensis is common throughout northern India, Pakistan from Sind through East Punjab to Assam, Manipur and Bangladesh. It occurs in Gujarat and exceptionally further south, Wenden's

record from Bhandup (Bombay suburb) being the southernmost for the species Hume (1890). It is very common in Bengal, Bihar and Uttar Pradesh and its nest colonies can be seen all along the North-Eastern Railway tracks in the U.P. terai. I observed them from Saharanpur to Purnea, during the breeding seasons from July to September, but most abundantly between Gonda and Gorakhpur in U.P. Although it is a bird of the lower elevations, there is a record of its breeding at Kurseong (Darjeeling dist.) at about 1300 m (Hume 1890). It is recorded from Nepal terai (Rand & Fleming 1957) but not from any other region or outside India.

ECOLOGY

The Blackthroated Weaver *P. benghalensis* is the commonest *Ploceus* species in the Kumaon terai standing first in order of population density ; it is essentially a bird of flat low-lying, usually swampy areas. At Rudrapur and Pantnagar all the breeding colonies seen were in tall grass (*Saccharum munja* or *Saccharum spontaneum*) and reeds (*Phragmites* sp.) standing in water or on the edge of ponds and ditches. Many colonies were seen along the irrigation canals and river beds. Nests were also abundant along the sides of the highways like those from Pantnagar to Rudrapur, Rudrapur to Kichcha and Rudrapur to Bilaspur. Reeds in wayside ditches and pools in residential compounds, near play grounds and grazing land, and behind hutments were equally favoured, and proximity of human beings was not a deterrent. In the Pantnagar Agricultural University campus colonies were also observed in the hostel compounds ; sometimes they were situated just below the windows, giving excellent opportunities for watching. The colonies were small and widely scattered. I did not find any colonies in the wooded area around Lalkua.

The breeding season commences after the onset of the monsoon and lasts from June to October.

NEST BUILDING

The nests are normally situated between about one and 2½ metres above the ground. For the selection of the nest site and construction of the nest, the male alone is responsible. The male, in breeding plumage, as soon as he arrives in the breeding area selects a site for his nest and begins construction. Selecting a few standing grass stems he pulls them together and ties them up at some height above the ground as if by a waist belt. A similar 'belt' of interlaced grass strips was also recorded in the construction of reed-bed nests of Finn's Baya (Ambedkar

1968). The nesting materials—strips of *Saccharum munja* or *Saccharum spontaneum* and *Phragmites*—are usually collected in the vicinity.

The 'waist belt' (Pl. I,a), draws the stems closer together to provide good support for the nest, placed some 15 to 30 cm above it. A wad-like foundation is fashioned, which develops into the most important stage of the nest—the 'helmet' (Pl. I, b, c). At this stage the male attaches mud-blobs and sticks bright-coloured flower petals into them in the form of rings. These petal rings can be seen from a considerable distance; their probable function is discussed later. The female usually visits the nest at this stage and if satisfied with the structure accepts it. The male continues construction, with egg chamber towards the grass stems and a long entrance tube on the outer side. As soon as the female begins incubation, the male goes on to construct another nest nearby which is also occupied in due course by a second female. Thus there is the same type of successive polygyny in the Blackthroated Weaver as described for *Ploceus philippinus* (Ali 1931). Usually the male completes the nest within five or six days but the tempo of his building activity depends mainly on the prospecting visits of unmated females.

Due to the weight of the nest, the flexible grass stems bend over, bringing the bottom of the egg chamber parallel with the ground and the mouth of the pendent entrance tube facing downwards (Pl. I,d). This gives better protection to the eggs and young from violent winds as well as making it difficult for nest-robbing predators to enter the nest. No abnormal nests were observed among the colonies.

It is a common sight in the breeding area to see aberrant, incomplete 'practice' nests built by the immature males of *P. philippinus*, *P. manyar* and *P. megarhynchus*, usually segregated from the breeding colony. Strangely enough nowhere were such half-built nests of juvenile *P. benghalensis* observed. This seems a marked deviation from the behaviour of other species, but it may also imply a difference in the period of maturing between *P. benghalensis* and the other three weavers.

CLUTCH SIZE

Table 1 gives the clutch-sizes of the Blackthroated Baya including the data collected by Sálím Ali and Crook. It shows that out of 110 clutches, 51 clutches or 46·3% belong to size-group of 3.

The mean clutch-size for the years 1959, 1961, 1962, 1963 and 1968 are 3·2, 3·3, 3·5, 3·0 and 3·2 respectively. The mean of five years is 3·2. The seasonal variations in clutch-sizes could not be studied as my visits to the Kumaon terai were brief.

TABLE 1
EGGS PER CLUTCH/NO. OF CLUTCHES

Year	1	2	3	4	5	6	7	Total
1959*	1	2	12	2	4	..	..	21
1961	1	1	9	9	..	..	..	20
1962	1	2	13	11	3	2	..	32
1963	2	4	3	3	1	..	1	14
1968	..	3	14	3	1	1	1	23
Total	5	12	51	28	9	3	2	110

* Data collected by Sálím Ali and Crook.

EGG WEIGHT

Fresh eggs or newly laid eggs were selected for weighing. The heaviest and the lightest weights were 2.7 gm and 1.8 gm respectively. The mean weight was 2.2 gm (35 observations).

INCUBATION

The female, as in other Indian weaver birds, is solely responsible for the incubation of the eggs. At the time of her entering the nest, the male usually greets her with quivering wings, but with lesser vigour and with low intensity as compared with the courtship period. As soon as a female occupies the nest, the male gives the finishing touches to it from outside and often inspects the nest carefully and minutely. He goes on either to lengthen the entrance tube or to construct a new nest nearby for another unmated female.

The female alone does the night brooding, entering the nest before sunset. I observed that in mixed colonies of *P. benghalensis* and *P. manyar*, the males of *P. benghalensis* were the last to leave the colony for the communal roost. In one instance (30th August) the last male left the colony at 6.52 p.m. after which there was complete silence.

TABLE 2
INCUBATION PERIOD

Incubation period days	No. of clutches observed
13	..
14	4
15	9
16	5
17	..

Showing the most frequent incubation period as 15-16 days.
Average for 18 clutches=15 days.

NESTLING PERIOD

The female Blackthroated Baya feeds the young on small insects, collecting the food from nearby fields. The male usually starts to collect food for the young only when they are about 10-12 days old. During the absence of the female on foraging trips, the male guards his nest and young and was observed chasing off Indian Wren Warblers (*Prinia inornata*) and Whitethroated Munias (*Lonchura malabarica*) from its proximity. In colonies of *Ploceus philippinus*, *Ploceus manyar* and *Ploceus megarhynchus*, the call-notes of the hungry young can be heard from a considerable distance, but *Ploceus benghalensis* young are almost mute and hardly any sound is heard even at close range. This habit probably helps to make the nests with young less vulnerable to predators.

The female removes faecal pellets of the young and drops them outside the colony.

TABLE 3
FLEDGING PERIOD OF THE NESTLINGS

Days after hatching	No. of young flew
14	10
15	11
16	14
17	..
Total	35

Average of period in nest = c. 15 days.

On leaving the nest, both male and female attend to the young, at least for a week, feeding them on insects, grasshoppers, etc. The young usually stay near the breeding colony for sometime and then disperse.

WEIGHT OF THE NESTLINGS

Weights of nestlings were taken in the evening after 6.30 p.m. By that time the females had usually stopped feeding them and the males were about to leave the breeding colony for roosting. This was a suitable time for weighing nestlings which showed the maximum weight attained during the day. The weights were taken as fast as I could, so that the females should have enough time to enter the nests for night brooding. The night brooding is very essential for the first few days, as without it the young would die of cold.

The nestlings usually left the nest when their weight reached 20.5 gm (Table 4). The average weight of adults (♂ and ♀) was 23.3 gm.

TABLE 4
WEIGHTS OF YOUNG OF *Ploceus benghalensis* FROM THREE CLUTCHES

I				
Age in days	Date	Young		
		I	II	III
1	5-9-1962	3.250	2.2	Infertile Egg
2	6-9-1962	..	..
3	7-9-1962	..	..
4	8-9-1962	9.1	6.6	
5	9-9-1962	11.2	8.2	
6	10-9-1962	12.2	10.3	
7	11-9-1962	14.2	13.4	
8	12-9-1962	18.7	15.6	
9	13-9-1962	20.1	18.1	
10	14-9-1962	22.3	19.6	
11	15-9-1962	..	..
12	16-9-1962	22.2	22.2	
13	17-9-1962	20.5	20.6	
14	18-9-1962	..	..
15	19-9-1962	Flew	20.0	
16	20-9-1962	..	Flew	

II				
Age in days	Date	Young		
		I	II	III
1	19-9-1962	4.1	3.650	Infertile Egg
2	20-9-1962	..	..
3	21-9-1962	..	..
4	22-9-1962	..	..
5	23-9-1962	12.3	11.2	
6	24-9-1962	..	..
7	25-9-1962	17.0	16.5	
8	26-9-1962	19.7	18.3	
9	27-9-1962	..	..
10	28-9-1962	21.2	21.0	
11	29-9-1962	..	..
12	30-9-1962	22.0	21.4	
13	1-10-1962	21.3	19.0	
14	2-10-1962	Flew	Flew	

III				
Age in days	Date	Young		
		I	II	III
1	28-9-1962	3.0	2.9	2.2
2	29-9-1962	..	..	..
3	30-9-1962	..	..	..
4	1-10-1962	7.6	7.4	6.4
5	2-10-1962	9.5	9.2	6.4
6	3-10-1962	11.7	10.0	8.3
7	4-10-1962	14.6	13.5	11.2
8	5-10-1962	..	..	..
9	6-10-1962	19.0	18.7	16.0
10	7-10-1962	..	..	..
11	8-10-1962	20.1	19.7	19.0
12	9-10-1962	..	..	..
13	10-10-1962	22.0	20.5	Disappeared
14	11-10-1962	..	..	..
15	12-10-1962	Flew	Flew	..

SOME NEW OBSERVATIONS ON THE COURTSHIP

Crook (1963) has described the courtship of the Blackthroated Baya and analysed the sequences fully. He states, 'At the start of breeding, the males keep strictly to their territories, building nests and supplanting intruding neighbours. The females fly into the colony, usually singly but occasionally in small groups, and proceed to hop through the territories and to approach the various nests. Should the male be absent, a female will alight in his nest, examine it, titivate upon it, and then hop on into the next territory. As soon as a male observes an approaching female he leaves his nest and flies towards her, often leaving his territory, alights close beside her, and gives an intense wing-beating display during which he moves along the grass stem towards her. Most of these displays occur on tall grass stems overhanging water which usually bend to a horizontal position under the weight of the performing birds The female crouches, somewhat sleeked but otherwise appearing unconcerned, until the male is very close to her. She then either hops a short distance away, flies a short distance, or pecks fiercely at her suitor'.

During the field work I had many opportunities to study this particular phase of the breeding cycle of the Blackthroated Baya and the following account is based upon the field observations made in 1962 and 1968.

Courtship occurs at the 'helmet' stage of the nest. It has been observed that the male adds mud blobs inside the corner of the 'helmet' or all along the inner margin of the 'nape' section which will later develop into the egg-chamber of the nest. He collects fresh mud blobs from nearby wet ground, or sometimes even cow-dung or human faeces, and sticks them to the wall within the 'helmet'. On 24 August 1968 I saw a male with a helmet stage nest in a mixed colony of *P. benghalensis* and *P. manyar*. A female approached quietly to inspect the nest. The male immediately started to quiver his wings and uttered feeble call notes which could be hardly heard from a distance. As the female sat on a nearby twig he approached her very closely almost touching her belly with his bent head, wings quivering, tail fanned, beak pointed to the ground presenting his brilliant yellow crown to the female. A few minutes later, he flew to a nearby tree (*Lagerstroemia*) and plucked a flower petal with his beak. Keeping the petal in his beak he came back and resumed the Wing-beating Display with head straight and bill directed towards the female, as if presenting the flower petal to her. Later he entered the helmet nest and stuck the flower petal in the wet mud blobs. He repeated the process several times, adding petal after petal in the mud blobs so that the helmet soon had a beautiful orange, crimson and scarlet coloured rim. Most often he collected yellow or orange coloured petals from *Lantana* and other wild flowers. The female

entered the nest and started to remove the decoration of the nest, including the mud-blobs. Usually copulation took place at this stage. Thereafter the male continued with his nest building, and the female duly laid the eggs.

It was observed that another male who also had a helmet stage nest in the colony, constantly stole the flower petals from the first nest to stick them in his own. Actually the pilfering of flower petals from each other's nests was a common occurrence in the colony.

Baker (1934) has recorded flower petals in nests of *P. manyar*, but there is no record of their being found in the nests of *P. philippinus* or *P. megarhynchus* although mud-blobs are common to all the four Indian species of *Ploceus*.

OBSERVED CASE OF CROSS-MATING

Crook (1963) mentioned a case in which a male *P. benghalensis* attempted to copulate with a female of *P. manyar*.

On 3rd August 1961, while watching a mixed colony of Blackthroated and Streaked Weavers on the outskirts of Rudrapur, I noticed a 'helmet' stage nest of *P. benghalensis*. The male was chasing a female of his own species and trying to attract her back again to his nest, evidently the behaviour prior to copulation. The female returned and sat on the 'cross-bar' and started to shape the nest. The male attended her for a while and then left the colony either to fetch nesting material or food or flower petals. While shaping the nest, the female with fluffed feathers, solicited by quivering her wings. Thereupon a male *P. manyar* who was nearby promptly mounted her. The female flew off and was chased by the *manyar*. Whether coition was completed or not, the point to note here is the response given by the male *P. manyar* to the behaviour of the female *P. benghalensis* and vice versa, which implies a certain looseness in the reproductive isolation mechanism between the two species and suggests the possibility of natural hybridization. No definite instance of this has yet come to light, although a hybrid has been reported between *P. philippinus* and *P. manyar* (Gray 1958).

NESTING SUCCESS

The hatching and nesting success was 76.7% and 50.0% respectively.

NEST COMPETITORS AND PREDATORS

During the investigation, several cases of breeding of the Tree Mouse (*Vandeleuria oleracea*) in the nests of *P. benghalensis* were observed. A

noteworthy observation was on 19th September, 1962, in a colony near the Rudrapur-Bilaspur road. A male was apparently fiercely defending his nest from other males, keeping them off from its proximity. His behaviour seemed curious so I approached the nest carefully, and as I touched it, a Tree Mouse jumped out and disappeared into the grass. Upon examination I found a ball of grass within—the normal nest of this rodent.

Often egg-chambers of nests were bored with holes, possibly an act of this nocturnal mammal. A Common Mongoose (*Herpestes edwardsi*) was observed feeding on the young of *P. benghalensis* in the campus of U.P. Agricultural University, Pantnagar.

Streaked Weaver

Ploceus manyar flaviceps

(Plate II)

GEOGRAPHICAL DISTRIBUTION

Two subspecies are known to occur in India (Ripley 1961) : *Ploceus manyar flaviceps* extends from Pakistan through the Himalayan terai and peninsular India to Ceylon, and *P. m. peguensis* occurs in eastern Bihar, West Bengal, Bangladesh and Assam. In the Kumaon terai all the four Indian Weavers, namely *Ploceus philippinus*, *P. megarhynchus*, *P. benghalensis* and *P. manyar* breed under more or less similar ecological conditions. The weaver birds in this area provide an unique opportunity for studying isolating mechanisms in the reproductive behaviour of these closely related species.

ECOLOGY

The Streaked Weaver inhabits swampy and rain flooded areas, particularly where tall grasses and reeds (*Phragmites*) and bulrushes (*Typha*) abound. The breeding colonies studied were situated in tall reeds standing in water and on the border of paddy fields, rain-water ditches and river banks. However, whereas the Blackthroated Weaver in the same habitat is closely addicted to thatching grass, e.g. *Saccharum munja*, this species is extremely partial to bulrushes (*Typha*) for nesting. Many colonies were also observed along the main highways, for instance between Pantnagar and Rudrapur and between Rudrapur and Gadharpur. Hume (1890) reported that the species had been seen breeding in thorny bushes, but in the study area I did not come across any such colonies. Mixed colonies of *P. manyar* and *P. megarhynchus* (Ambedkar 1968) and *P. manyar* and *P. benghalensis* in reeds are not uncommon in the terai.

Most of the breeding colonies were away from human habitation or on the outskirts of villages, but sometimes the birds did breed in more urban surroundings as in gardens near houses. For instance, in 1968 a mixed colony of *P. benghalensis* and *P. manyar* was located in the compound of the Guest House at U.P. Agricultural University. It was situated among reeds surrounding a ditch. Usually the colonies were small consisting of about 12-20 nests, but the largest colony of 60 nests was seen on the outskirts at Gadharpur village. No breeding colony of *P. manyar* was seen in the wooded part of Lalkua, suggesting that this species also requires open grassland and reed-beds.

NEST-BUILDING

The breeding season commences after the onset of the SW. monsoon, which usually starts in June and ends in September. As in the common Baya the male alone builds the nest. When the reeds are about three to four feet high, he takes up a territory and commences to build. The general architecture of the nest and the different stages of its construction are remarkably similar to those observed in the Baya (*Ploceus philippinus*) (Ali 1931, Ambedkar 1964), and also in the Blackthroated Weaver (above).

The tips of bulrushes (*Typha*) growing some distance apart are pulled in by the male and bent inwards, like the ribs of an umbrella, and bound together at the centre where they meet. This is the suspension point of the nest (Pl. II, a, b). Thus the nest is situated at the centre of an elastic framework of reeds which keeps the structure well above the water level. As the water level falls the reeds, along with the nest, slowly bend lower. This lowering of the reeds protects the nest and its contents, especially eggs, from high winds. For the construction of the nest the male collects fresh flexible green strips of *Typha* which are readily available at hand, and therefore he is able to construct two or three nests in quick succession. Unlike the Baya, the Streaked Weaver collects only a single broad and rather thick bulrush strip at a time. Holding the strip in the bill the bird springs up towards the free end of a *Typha* leaf. After gripping it in his bill he flutters back to the nest bending the leaf down with his weight thus incorporating the leaves one by one in the nest structure and securing each firmly with the strips he has brought in his bill. As soon as the nest reaches the 'helmet' stage, the male adds mud-blobs or plasters the lower portion of the nest (Pl. II, c). Frequently, but not as regularly as in the Blackthroated Weaver (*Ploceus benghalensis*), he also sticks brightly coloured flower petals in the mud-blobs. Baker (1934) has also reported seeing flower petals in the nests of the Streaked Weaver. It has been suggested above in the case of the Blackthroated species, that the flower petals are used in courtship to attract a female. The courtship takes place at the 'helmet' stage of the nest.

One of my field notes on courtship reads as follows : ' Today (23 Sept. 1962) the sky is clear with bright sunshine after two days of heavy showers with gusty winds. I visited the colony at Jafarpur canal and noticed considerable nesting activity. All the nests had reached the "helmet" stage. The males were singing, and the visiting females were greeted with bursts of song and quivering and spreading wings. The females were prospecting for suitable nests, visiting and inspecting them one after another. When a female sat on a particular nest, the owner greeted her with song and with the "Wing-beating Display". If the female left the nest, the owner followed her awhile. As soon as the female left the colony, the male returned and sat on the nest. He collected nesting materials from bulrushes and added them into the nest structure. If a female flew over the colony all the building males suddenly burst into song and vigorously attended to their nests. If a female accepted a particular "helmet" stage nest, copulation took place on the cross-bar of the nest.'

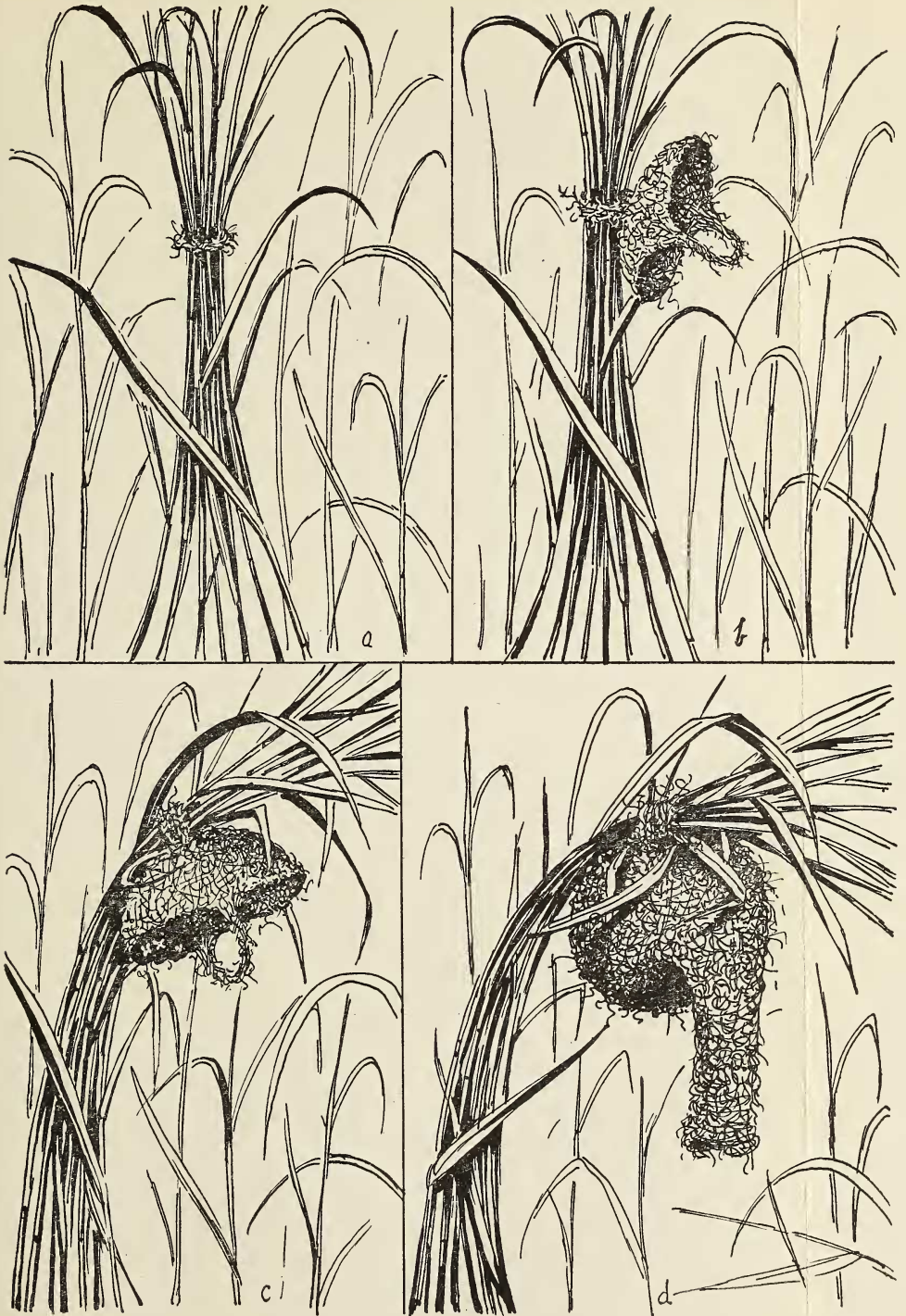
The eggs are laid about three or four days after copulation. Once the nest is completed the male usually pays little attention to its maintenance, with the result that the structure looks bedraggled with loose fibres hanging about. The entrance tube is short as compared with the nest of the Baya and the Blackthroated Weaver. Thus the nest has the shape of a retort with entrance from below (Pl. II, d).

Mixed colonies of *P. manyar* and *P. benghalensis* where the birds are breeding side by side, provide interesting material for comparative study. *P. benghalensis* selects the denser parts of the reed patch (mostly *Saccharum munja*) as the species requires a larger number of grass blades for the support of its nest. I counted (30 Sept. 1961) the number of supporting reeds which are respectively incorporated in the nest of *P. benghalensis* and *P. manyar*. The former collected 78 (average) blades of *Saccharum* as against 32 *Typha* blades in the latter. Usually the nests of *P. benghalensis* are built in clusters of three or four nests whereas the nests of *P. manyar* are scattered individually in the same *Typha* bed.

P. manyar is polygynous. Crook (1963) described monogamy in the terai, while Sálím Ali suggested that the species is polygynous. My observations made in 1968 confirm the latter view. One male completed three nests in succession which were duly occupied by females, in addition to a fourth nest left unfinished at the 'helmet' stage.

CLUTCH SIZE

Table 5 shows the average clutch-sizes of the Streaked Weaver for the years 1959, 1961, 1962 and 1968. Data collected by Sálím Ali & Crook in the year 1959(*) are included. The average clutch-sizes were 2.8, 2.4, 3.2 and 3.1 respectively, while the overall clutch-size for the four



Ploceus benghalensis

Stages of nest construction among thatching grass (*Saccharum* sp.)

(a) The initial 'waist' belt (b) A further stage in the attachment; (c) The helmet stage showing mud plastering along edge of nape portion, with flowers implanted; (d) The completed nest.



Ploceus manyar

Stages of nest construction among bulrush leaves (*Typha* sp.)

(a) The initial 'wad'; (b) A further stage in the construction of the nest; (c) The 'incubated' stage, showing much planing and smoothing of the sides; (d) The completed nest.

years was 3.0. Table 1 thus shows that 3 is the commonest clutch-size in this Weaver in the Kumaon terai; out of 84 clutches, 44 or 52.3% belong to this size group.

TABLE 5
EGGS PER CLUTCH/NO. OF CLUTCHES

Year	1	2	3	4	5	6	Total	Mean eggs per clutch
1959*	..	2	4	1	..	..	7	2.8
1961	2	2	6	..	..	..	10	2.4
1962	1	6	20	8	2	1	38	3.2
1968	2	4	14	6	3	..	29	3.1
Total	5	14	44	15	5	1	84	3.0

EGG WEIGHT

The eggs are white in colour as in other Indian weavers. They are laid mostly early in the morning. Weights were taken as soon as the eggs were found in the nests. The average weight of the fresh egg was 2.3 gm (36 observations): maximum 2.7 gm, minimum 2.0 gm (see Table 6).

TABLE 6
WEIGHTS OF FRESH EGGS

No. of observations	1	6	4	6	5	5	8	1	36
Grammes	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	

INCUBATION

This is the most interesting part of the breeding cycle in the case of *P. manyar*, as it shows a marked deviation from the general pattern observed in other Indian weavers. In other Indian weavers the female is solely responsible for the incubation of the eggs. However, in the Streaked Weaver the male also takes a little part in this chore, at least for the first or second day, when the female is still laying. One of my field notes reads :

‘29-viii-1962 while I was observing a nest of the Streaked Weaver in a *Typha* reed-bed, a female went out of the nest probably for foraging. The male was singing, standing on the top of the nest. After a while he quietly entered the nest and sat on the eggs for eight minutes. He came out as soon as the female returned. There was only one egg in the nest’.

A similar incident was observed on 22nd September 1962, and again in the 1968 breeding season suggesting that incubation by the male is a common feature in the Streaked Weaver. In all these instances, there was only one egg in the nest. Crook (1963) mentions two cases where males were seen incubating eggs ; no details are given.

The female usually starts to incubate regularly from the second egg ; the male continues to construct the tube of the nest.

Table 7 shows the period of incubation to be 14 to 17 days.

TABLE 7
INCUBATION PERIOD

No. of days	No. of clutches observed
14	2
15	8
16	6
17	5

During the day the movements of the females are very irregular. They usually sit on the eggs for a few minutes and come out of the nests again either for bathing or feeding. It is assumed that these restless movements are attributable to heat and the high atmospheric temperature. Incubation is continuous during the night, the females entering the nests about sunset and emerging before sunrise.

NESTLING PERIOD

Usually the female broods the nestlings from the first day of hatching till the young are about a week old. During this period she is solely responsible for feeding the young. However, when the young are about 10 days old the male also starts to feed them. The food is usually collected from nearby rice fields and consists mainly of small insects, soft grains and grass seeds, etc.

TABLE 8
NESTLING PERIOD

No. of days	No. of young fled
15	1
16	2
17	6
18	5
19	2
20	1

Average period in nest = c. 17 days.